CALL FOR SUBMISSIONS (CFS)
CFS Number 2011DRI

California Department of Transportation
Division of Research and Innovation
2011-2012 Research Proposal Guidelines

A CONTRACT MAY OR MAY NOT BE AWARDED FROM THIS CFS.

The Division of Research and Innovation (DRI) of the California Department of Transportation (Department) is requesting research proposals from public research institutions: public colleges, universities, and government agencies that bring solutions to the Department's research problems. Respondents are encouraged to engage in collaborations with industrial and public agency partners, and to enhance the research and to facilitate communication of research results to those who deploy and operate transportation systems (technology transfer).

Private universities or institutions are not eligible participants under this Call For Submissions (CFS) process and direct submittals from these institutions cannot be accepted. Public institutions using subcontracts with private entities are subject to certain conditions and may not be eligible under this CFS process. Respondents who have concerns over their eligibility are encouraged to contact the DRI representative identified below to determine their status prior to spending time and resources on a proposal.

All needs in this CFS are based on an Initial Description of Work (IDOW) derived from a customer need. The CFS focuses on the application of solutions to meet the Department's mission of improving mobility across California. This research will specifically address the following Department goals:

- SAFETY: Provide the safest transportation system in the nation for users and workers.
- MOBILITY: Maximize transportation system performance and accessibility.
- DELIVERY: Efficiently deliver quality transportation projects and services.
- STEWARDSHIP: Preserve and enhance California's resources and investments.
- SERVICE: Promote quality service through an excellent workforce.

DRI is advertising this CFS with three IDOW in various categories (Refer to page 13). Public institutions are invited to review and respond to this CFS Number 2011DRI, titled, **"California Department of Transportation, Division of Research and Innovation, 2011-2012 Research Proposal Guidelines."** Please refer to the link below for access to electronic versions of the CFS document and IDOW. Proposals must be submitted by **August 29, 2011** at **5:00 PM (PST).** Proposals must be a fully developed bid, with a clear scope of work linked to timelines (in weeks, not specific dates), milestones, and deliverables. Each major category in the budget shall be fully supported within the bid.

http://www.dot.ca.gov/research/cfs2011.htm

Please see the schedule in the Proposal Submission/Evaluation Process section of the CFS. In submitting your documents, you must comply with the instructions found herein. Reference the attached CFS Initial Description of Work for detailed information.

If you have questions, the contact person for this CFS is:

Yvonne Cooks
Division of Research and Innovation
California Department of Transportation
Email: yvonne.cooks@dot.ca.gov
Fax Number: (916) 657-4721

All questions must be submitted on or before **August 15, 2011** at **5:00 PM (PST).** Questions will be collected and responded to in a single public response made available via a public posting via the following internet site. All participants will be advised of the posting when it is available. All questions will be stripped of any identifying information traceable to the originating participant.

Responding parties shall submit their formal proposals and supporting documents in electronic format to:

Yvonne Cooks at yvonne.cooks@dot.ca.gov

In the event Caltrans elects to issue a contract for this work, the selected proposal(s) and supporting documents shall be made available to Caltrans in a Microsoft WORD (*.DOC) compatible format, in addition to an Adobe PDF compatible format. This will facilitate development and processing of the actual contract documents.

This CFS contains a preliminary representation of terms and conditions relating to the research problem statements included in this CFS. In the event a contract is awarded, the final terms and conditions may vary from this initial representation, depending upon the exact nature of the contractual arrangement between the parties.

Proposals must be received no later than **5:00 PM (PST)** on **August 29, 2011**.

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I. GENERAL BACKGROUND

The California Department of Transportation (Department) is the manager of interregional transportation services; more specifically, the Department has the traditional role of owner and operator of the 15,000 mile State Highway System. The Department promotes California's economic vitality and enhances its citizens' quality of life by providing for the movement of people, goods, services and information. The Department is responsible for the delivery of the State's Transportation Improvement Program; planning, designing, building, operating and maintaining California's state highway systems. In addition to a changing mix of transportation modes (highways, rail, mass transit, bicycle, pedestrian, and aeronautics), the Department coordinates the solutions to complex issues such as land use, environmental standards, and the formation of partnerships between private industry and local, State and Federal agencies to promote productivity, reliability, safety, flexibility and performance in the State of California. For more information, access the following link: http://www.dot.ca.gov/

The Department has developed a five stage research and development process guided by the Research and Deployment Steering Committee (RDSC), consisting of Deputies and District Directors. The RDSC, in turn, created Program Steering Committees (PSCs) and Technical Advisory Panels (TAPs) to assist in developing the research agenda and deploying research products. These stages of research and development are:

- **Stage 1:** CONCEPT STAGE
- **Stage 2:** LABORATORY PROTOTYPE STAGE
- **Stage 3:** CONTROLLED FIELD DEMONSTRATION STAGE
- **Stage 4:** FIRST APPLICATION (CONTRACT) FIELD PILOT STAGE
- **Stage 5:** SPECIFICATION & STANDARDS WITH FULL CORPORATE DEPLOYMENT STAGE

The functional Division Chiefs responsible for the areas of research interest lead the PSCs. Together, these Division Chiefs form the Research Deployment Advisory Committee (RDAC) and advise the RDSC on research topics of interest and recommended priorities. Senior staff from the responsible Divisions lead the TAPs. The TAP membership can also include technical experts from other Divisions, Districts and/or external agencies. Project Panels are formed for each project, consisting of the Project Manager (PM), Customer Representative (CR) and other members as selected by the PM in consultation with the CR. The responsible Project Panel and the responsible TAP have developed the enclosed IDOW(s), and the responsible Project Panels will review and select any resulting research proposal(s). The PSCs and the RDSC will make the final determination on which, if any, proposal(s) will become actual research projects. This system provides customer participation throughout the research process and customer ownership of research products.

II. RESEARCH NEEDS

Highlighted issues in this specific CFS are:

- This CFS is organized according to the Division's customer needs within the **Modal** category only.
- Respondents should clearly demonstrate how their specific proposal(s) would benefit the traveling public and contribute to meeting the five Department goals shown on the first page of this document.
- The Department's research needs in this area are described in the IDOW outline included within this document.
- This CFS identifies important problem(s) that need to be solved. Since this project is a continuing research project past Stage 1 of development, this CFS may give specific guidance on how problems should be addressed and solved.
- Proposals need to be focused on how the implementation of their results can be used to improve transportation.
- In order to promote synergy among diverse research projects, respondents should consider how their efforts and findings might potentially be integrated with other research projects, as well as transportation planning and deployment projects, in specific California regions or corridors.
- Where appropriate, Department staff will work with the proposal authors of selected proposals to strengthen the project's implementation effectiveness and to facilitate its integration with other new and ongoing research, planning and deployment projects.
- Multi-disciplinary and multi-campus research teams are encouraged in order to integrate diverse research capabilities.

III. PROPOSAL FORMAT AND CONTENT

The research proposal should provide a detailed description of the research to be undertaken. The body of the proposal shall be limited to **twenty-five (25) pages maximum**, not including curriculum vitae or supporting appendices. Each proposal, including curriculum vitae, budget, timeline, appendices and cover page, must be in a single file, in either a Microsoft Word 2003 (*.doc) compatible format or an Adobe PDF compatible format. No zipped files will be accepted. The proposal shall contain the following information and be presented in the following order:

1. Cover
2. Executive Summary
3. Table of Contents
4. Research Plan
   A. Introduction
   B. Problem
   C. Background/Business Case
   D. Research Approach
   E. Anticipated Research Results and Benefits of Research
   F. Deployment Plan

5. Research Team
   A. Qualifications
   B. Accomplishments
   C. Other commitments
6. Equipment and Facilities
7. Work Schedule (showing all deliverable milestones)
8. Itemized Budget (based on task deliverables and fiscal year)
9. Partnerships/Subcontracts
10. Appendices
11. Vitae

1. Cover Page

The cover page must include the date, Initial Description of Work identifier, title; proposal title; lead researcher's name, affiliation telephone number, email address and address; key supporting researcher(s) name(s) and affiliation(s); name(s) and address(es) of any organization(s) with which a joint venture is proposed, if such is the case; the name and title of the person formally submitting the proposal; the name(s) and title(s) of the proposal author(s); the project duration; and the project budget for each specific fiscal year where research if performed and a total budget summary across all fiscal years (See **Figure 1**).

2. Executive Summary

The Executive Summary should be a concise, easily understandable presentation of the proposal in two pages or less. Each item from #4 through #10 above should have a separate heading and a brief description.

3. Table of Contents - Reference Page

4. Research Plan

The research plan shall be subdivided into the following sections:

(a) *Introduction* - The introduction to the research plan should provide a concise overview of the respondent's approach to conducting the research. It should describe the manner in which the expertise and experience of the proposed team will be used in the research, and the application of special data, facilities, contacts, or equipment should be presented. The introduction should highlight the linkages of the proposed team's capabilities to the project tasks and the manner by which the proposed plan will satisfy the objectives.

(b) *Problem* - Provide a brief technical description of the problem and why a solution is needed.

(c) *Background/Business Case* - Provide a brief discussion of the background and business case supporting the proposed research effort. Topics for discussion may include the following:

- Review related/complementary research completed or underway in the problem area. (Literature search)
- State proposed research scope, objectives, and motivation; specifically addressing the Department's goals.
- Describe the impact of the proposal on the existing transportation issue/problem/need.
- Identify the anticipated customers/users.
- Explain why and how this research project is important to the improvement of California's transportation system.
- State the consequences for the Department and its customers if the problem/opportunity is not addressed.
- Provide a brief benefit/cost statement, indicating the anticipated benefits that will be derived from the ultimate product that is the subject of the work to be performed in the proposal.

(d) *Research Approach* - This section shall be used to describe the proposed methodology of the research and how the objectives will be achieved through a logical, innovative, and rational scientific plan. The plan shall describe each phase or task of the research to be undertaken. Explain the proposed research methods in sufficient detail to enable evaluation of feasibility, originality and significance of the proposal.

If appropriate to the content of the proposal, describe the current technology, policy or process that is the subject of the proposal. If the research project involves selection of a specific solution from among multiple alternative approaches, explain the reasoning behind that selection.

- Describe the alternatives.
- Identify the alternative that best satisfies the objectives.
- Explain why the selected solution was picked over the other alternatives.

(e) *Anticipated Research Results and Benefits of Research* - The research plan for each proposal shall contain specific statements describing the anticipated research results. The results are expected to be presented in terms of the language and working tools of the practitioner or administrator so as to be immediately applicable to practice. Consequently, there must be specific statements of the manner in which the desired results would be reported (e.g., mathematical models, design techniques, field or laboratory test procedures or recommendations for changes in Department policy, practices, procedures, or standard highway specifications).

(f) *Deployment Plan* - DRI projects are intended to produce results that will be applied in practice. Therefore, proposals and the project final report must contain a deployment plan for moving the results of the research into practice. Refer to the "The Department's Five Stages of Research Deployment" for guidance when developing deployment plans (See **Figure 2)**. Under Item 4(f), each proposal must include a preliminary deployment plan that describes any future activities necessary

to actually apply the product of the research in the proposal. It is expected that the deployment plan may evolve during the project; however, proposals must describe, as a minimum, the following: **(a)** the "product" expected from the research, **(b)** the audience or "market" for this product, **(c)** a realistic assessment of impediments to successful deployment, **(d)** the institutions and individuals who might take leadership in applying the research product, **(e)** the activities necessary for successful deployment, and **(f)** the criteria for judging the progress and consequences of deployment, and **(g)** a projected schedule for major tasks.

If the nature of a specific proposed research effort is such that it is already recognized or known initially that the results will not be amenable to immediate deployment into practice, the research plan must include realistic recommendations for the additional work necessary to reach the deployment stage.

5. Research Team

When relevant, highlight the contribution of other researcher collaborations (across disciplines and campuses or with private sector) to the project.

(a) *Qualifications of the Research Team* - Proposals must describe how the research team members' academic, industrial, and/or research experiences relate to the project to be undertaken. (Identification and contact information for all researchers should be on the title page, leaving this section specifically for documenting the background and skills each researcher brings to the project. This should NOT be a copy of the Vitae, but a succinct summary of those skills and experiences that contribute to solving the problem being researched.)

(b) *Accomplishments of the Research Team* - Proposals shall contain a summary of the past accomplishments ("track record") of the research team in the same, or closely related, problem area of the project to be undertaken. This summary is to include full particulars concerning all known instances of application to practice of the agency's research results. If no such knowledge exists, it should be so stated. (Again, this should NOT be a copy of the Vitae, but should identify specific accomplishments that will contribute to the success of this project)

(c) *Other Commitments of the Research Team* - Proposals shall contain a listing of current organization and personnel commitments to work on this project and to work other than this proposed project. The description shall be provided in sufficient detail to indicate that the organization and all of the individuals assigned to the proposed project will be able to meet the commitments of the proposal. Staff-hour commitments and percentage of time committed to this project and to other work for each member of the proposed research team shall be specified.

6. Equipment and Facilities

This section shall include a description of the facilities available to undertake the research and an itemization of the equipment on hand that will be used to complete the research. In the event that use of the facilities or equipment is conditional, the

conditions should be described. In the event that certain facilities or equipment are considered necessary to undertake the research but are not on hand, that fact should be presented. The respondent should identify any arrangements that will be made to purchase, borrow or rent necessary equipment. Letters of commitment should be included in the appendices to indicate the availability and commitment of equipment. Rental rates should be included in the budget for equipment to be rented. In the case where it is contemplated that additional equipment will be purchased under project funds, be certain that the budget item "capital equipment" indicates this and a detailed price list is included in the proposal.

7. Work Time Schedule and Deliverables

For planning purposes, any resulting contract(s) will be scheduled to start on or after **January 2, 2012**. The time required to complete the research project shall be clearly specified in the proposal using a months after contract award (MACA) basis. Proposals will not be rejected if the proposed time does not exactly match the time specified in the IDOW included in this CFS; however, any differences must be clearly identified and explained in the proposal. In addition, proposal shall include a Gantt chart type of schedule that shows each phase or task of the work. Schedule shall identify when a phase or task will begin, how long it will continue, and when it should end. The schedule and timetable should clearly delineate the points in time where a project deliverable and/or report are planned. For reports, the timeframes shown in the proposal schedule shall be sufficient to allow for initial development, shall include a single 45-day Caltrans review of any draft documents, shall accommodate incorporation of Caltrans comments and suggestions, and shall also accommodate the final submittal and approval cycle with an additional 45-day approval period of the final document. Any additional internal requirements that a proposer may need to accommodate that could affect the schedule of the research, shall clearly be delineated within the schedule and stated as a contingency. This may include items such as a University or Corporate Board approval needed prior to any human testing, etc.

At the conclusion of the project, the researcher(s) shall deliver a final report and shall also **present** the research results to the Department in a workshop forum, including a full explanation of the perceived applied usefulness of the research and follow-on steps. This may be done as a single-topic workshop or bundled with other related topics benefiting from a meeting style presentation. (Expenses, including travel, for this workshop shall be included as part of the budget and the workshop shall be shown on the schedule.)

8. Itemized Budget

The estimated cost for the project should be based on the proposed performance period. Lump sum estimates are not acceptable; budgets shall be detailed and itemized.

The budget table must include hourly breakdowns for every principal member of the research team, including consultants and subcontractors. Actual hours should be shown rather than months or dollars. In addition, it is preferred that only one table be

submitted rather than separate tables. The table should be located immediately behind the *Itemized Budget.*

Budget categories must include, at a minimum:

a) The number and type of personnel, their associated labor rates and benefit rates;
b) Equipment, (each major equipment item over $5,000 must be specifically identified);
c) Supplies and Miscellaneous Expenses;
d) Travel; and
e) Direct Overhead.

All overhead expenses must be detailed and justified (e.g., benefit, subcontract, material, labor, etc.). Please note that in addition to the total proposed budget, a breakdown by category is required for each fiscal year, which runs from July 1 to June 30. (Note: Contract start date should be planned to start on or after **January 2, 2012**.)

Proposals shall be a fully developed bid with a clear Scope of Work linked to timelines in months after contract award. It is not necessary to use specific dates (i.e. October 30, 2012) for task durations, milestones, and deliverables within the schedule. It is sufficient to use days/weeks/months after contract award for timeframes within the schedule. Provide only a single text reference for the anticipated start date as part of the proposal. Each major line item in the schedule shall be fully justified within the budget.

9. Partnerships/Subcontracts

If assistance in the form of personnel, data, or equipment, etc is required from other agencies, public or private, describe the plans for obtaining such help or information. In the case where cooperative features play an important part in the conduct of the research, a letter of intent from agencies agreeing to provide cooperative features should be included in the appendices.

10. Appendices

The appendices may include such things as letters of intent from agencies agreeing to provide cooperative features, or letters of commitment regarding any arrangements that will be made to purchase, borrow or rent necessary equipment. Appendices shall be limited in use to important supporting information. Excessive use of appendices to expand the general overall proposal may result in a lower grade for the proposal.

11. Vitae

The proposer may include customized Curriculum Vitae for each member of the research team, highlighting only those items that are pertinent to this specific research proposal. The Vitae, including a list of publications and awards, should **not exceed four pages per researcher.**

IV. QUESTIONS AND ANSWERS

Respondents with questions about the requirements of this CFS must submit those questions in writing to the email address shown below on or before **5:00 PM (PST)** on **August 4, 2011**. Question submittals must include the name of the individual or research institution submitting the question and a point of contact in the event clarification is needed. All correspondence should be emailed to the following contact:

Yvonne Cooks at: yvonne.cooks@dot.ca.gov

After the indicated deadline for question submittal has passed, questions will be collected, answered and publically posted on the Department's DRI website per the indicated schedule. All information traceable to the individual and/or organization submitting the question will be removed prior to posting of a response by DRI. (See web link below).

http://www.dot.ca.gov/research/cfs2011.htm/

A hard copy of written responses to the collected questions will be provided upon specific request.

V. PROPOSAL SUBMISSION/EVALUATION PROCESS

Proposal Submittal, Modification, Resubmittal, and Withdrawal

Proposals should be emailed, with the CFS# and Initial Description of Work identifier in the subject line, and Project Title and Respondent's Name/Research Institution in the email text. Respondents are to submit proposals to:

Yvonne Cooks at: yvonne.cooks@dot.ca.gov

Respondents submitting proposals may modify or withdraw the proposal at any time prior to the submittal deadline. Such modification or withdrawal of a proposal shall be in writing and submitted by the same person submitting the original proposal.

If the modification requested is only an addition to a proposal, a modified copy of the entire revised proposal should be emailed, with the CFS# and "Revised Substitution for (Initial Description of Work identifier and title)", in the subject line of the email.

Evaluation Process

The proposal evaluations will be completed by the Department's Project Panels. The Department's Program Steering Committees and Research and Deployment Steering Committee will make final selection. Proposals will be screened against the evaluation criteria below.

Proposal Evaluation Criteria

- Organization: Adheres to requested page limits and outline? Is the proposal well written?

- Research Plan: Comprehensive literature search completed? Are the plans, methods, techniques and procedures feasible, clear, valid, adequately referenced, and state-of-the-art? Are the research results valuable to the Department?
- Research objective: Are the stated objective, scope and motivation clear, valid, and logical? Responds well to problem statement and meets Department goals?
- Deployability of research outcome: When will the ultimate product(s) that is the subject of the research be available and is it likely to be deployed? (See **Figure 2** for information on stages of deployment.)
- Qualifications: Are the qualifications, capabilities, and experience of the proposed lead researcher and other key personnel sufficient to achieve the proposed objectives? If applicable, is proposed research facility adequate for proposed work?
- Budget: Does the budget reflect the actual needs of the proposed work? Have the requests for personnel, equipment, supplies, etc. been fully justified? Have cooperative features, partnerships and subcontracts been fully identified?

Acceptance and Rejection of Submissions
DRI retains the right to disregard a minor deviation from the requirements and may, at its sole discretion, request supplemental information or clarification of the information submitted by any respondent.

Negotiations with Selected Respondent
Once a proposal is submitted, DRI may elect to negotiate with the any selected respondent or group of respondents. These negotiations may or may not result in a written agreement with DRI about implementing the proposal. Any agreement as a result of this CFS will be subject to all necessary State, Federal, Agency and Department approvals. If an agreement cannot be reached, negotiations will cease and no contractual agreement, written or implied, will exist. DRI will not reimburse submitting organizations for any costs incurred in the preparation or submission of pre-proposals or proposals, nor for any expenses incurred in the negotiation process.

This CFS shall not commit DRI to negotiate and execute any contract or agreement. DRI reserves the right to accept proposals that, in the sole judgment of DRI, are in the best interest of the State or other research customers. DRI reserves the right to reject any or all proposals or to modify or cancel, in part or in its entirety, this CFS.

VI. GENERAL INFORMATION

Confidentiality
Proposal submittals are confidential. Selection committee members shall discuss the evaluation proceedings and content of proposals only with DRI staff and with members of the selection committees. Proposals that are not selected will not be reprinted or used for purposes not pertaining to this CFS process. Information on proposals that are selected will not be released until a contract is in place.

Supporting Documents
There may be supporting documents posted on the CFS web page. Respondents are encouraged to review these documents prior to submitting a proposal. These documents are intended to help establish and frame the amount of work needing to be done for selected elements of this Initial Description of Work.

Amendments to this CFS
DRI reserves the right to amend this CFS by addendum prior to the final date of proposal submission.

Schedule
The schedule related to this CFS is as follows:

EVENT	DATE
CFS Available to Prospective Respondents	July 21, 2011
Proposal Written Question Submittal Deadline	August 4, 2011
Responses to Questions	August 15, 2011
Final Date for Proposal Submission	**August 29, 2011**
Proposal Selection	September 19, 2011

VII. RESEARCH INITIAL DESCRIPTION OF WORK

The name and title of the Initial Descriptions of Work are:

12_MO 01: Park and Ride Demand Management

12_PS 01: Air Quality: The Effectiveness of High Occupancy Vehicle (HOV) Lanes

12_PS 02: Development for the GPS – Automated Travel Diary (GPS-ATD) in Preparation for the 2010 Statewide Travel Behavior Survey

12_PS 03: Air Quality: Mitigation Measures

FIGURE 1
Example Cover Page

COVER PAGE

Proposal Title:	Use Initial Description of Work Number and Title: (Work Number and Title of Initial Description of Work as shown in Section VII)
Proposing Organization:	(Use respondent name that will appear on contract; include address, email, and telephone number)
Person Submitting Proposal:	(Name and Title)
Proposal Written by:	(Name and Title)
Proposal Date:	_____
Principal Investigator:	(Name, Title, Business Telephone Number and e-mail address)
Additional Investigators:	(Name, Title, Business Telephone Number and e-mail address; include all team members other than PI)
Administrative Officer:	(Name, Title, Business Telephone number and e-mail address)
Proposed Contract Start Date:	(i.e. "**January 2, 2012**")
Proposed Contract Period:	(In Months)
Fiscal Year 2011/12 Cost:	_____
Fiscal Year 2012/13 Cost:	_____
Fiscal Year 2013/14 Cost:	_____
Fiscal Year 2014/15 Cost:	_____
TOTAL COSTS:	_____

FIGURE 2
The Department's Five Stages of Research Deployment

1. CONCEPT STAGE
- First steps following problem statement and proposal
- Includes detailed literature search
- Involves experimental design, data collection, analysis and reporting
- Assesses results of research
- Defines barriers to implementation (e.g. policies, specifications, standards)
- Submits a Final Report and outlines a recommended implementation plan

2. LABORATORY PROTOTYPE STAGE
- Develops breadboard circuit or computer system modeling
- Demonstrates operation in laboratory setting
- May incorporate customized or one of a kind components
- Assesses results
- Submits Final Report and recommends design of full scale demonstration

3. CONTROLLED FIELD DEMONSTRATION STAGE
- Prepares for full scale testing of demonstration project
- Includes collaboration with outside agencies or other state DOTs and US DOT
- Controlled tests at specialized facilities are observed and supported by cooperating agencies, industry and technical associations
- Potential end users are enlisted to support the field pilot stage
- Assesses results
- Submits Final Report and recommends site/conditions for first application pilot stage

4. FIRST APPLICATION (CONTRACT) FIELD PILOT STAGE
- Works with potential end users to select site and to conduct pilot testing under real world operating conditions
- Test specifications and standards are developed
- Research assistance given to assure proper installation and operation
- Problems are corrected and adjustments made, as necessary, to complete pilot testing
- To the extent possible, potential end users operate the project under careful research surveillance
- Assesses results
- Submits Final Report and recommends initial sites for full corporate deployment

5. SPECIFICATION & STANDARDS WITH FULL CORPORATE DEPLOYMENT STAGE
- End users select site(s) and deploy the method/process/equipment using resident management, supervision, staff, and contracting forces (where applicable)
- Deployment is without research supervision or direction
- On call assistance is available upon request
- Assesses results

Event Proposal
Doyle Drive Replacement Project
Media Event for Driving Simulator
District 4 (Oakland)

Type of Event:	Media Event
Event Sponsor:	Autodesk (Software Designer) Caltrans District 4 San Francisco County Transportation Authority (SFCTA) Parsons Brinckerhoff
Event Description:	To provide the media with an opportunity to test drive the Presidio Parkway simulator before it is opened to the public. Autodesk sponsored the development of a driving simulator to be placed in their gallery, which is located in downtown San Francisco. The simulator is a fun and exciting way for the public to experience the future Presidio Parkway before construction is complete. Will also be available to provide updates on the Doyle Drive project if media inquires.
Event Location:	Autodesk Gallery, 2nd Floor, One Market Street, San Francisco
Target Date(s):	Week of February 21, 2011 or Week of February 28, 2011
Technology Benefits:	The use of Building Information Modeling and Design Software is proving to be useful in identifying design issues before they reach construction. Autodesk has taken this technology and applied it to a driving simulator to give the public an opportunity to virtually experience the new Presidio Parkway prior to the project's completion. This tool also offers an opportunity to educate the public first-hand regarding the new alignment including highway curvature and tunnels.
State Role in Project:	Allowed Doyle Drive to be used in simulator technology.
Potential Participants:	All Bay Area Media Bijan Sartipi, Dan McElhinney, Gene Gonzalo, or Skip Sowko, Caltrans District 4 Kevin Gilson or Brady Nadell, Parsons Brinckerhoff Doug Eberhard or Jason Medal-Katz, Autodesk José Luis Moscovish or Lee Saage, San Francisco County Transportation Authority
Cost:	No cost to state for simulator.
Event Contact(s):	Traci Ruth, Caltrans Office of Public Affairs, 510-286-6120 Molly Graham, SFCTA Public Information Officer, 415-990-0292

DIVISION OF RESEARCH AND INNOVATION

Research Initial Scope of Work

SUBMITTAL FORM - FY 11/12

I. **Project Number:** P575
Project Title: Park and Ride Demand Management

II. **Task Number:** 2256
Task Title: Laws and Regulations Affecting Park and Ride Lot Performance

III. **Project Problem Statement:**

Park and ride lots are important elements of complete transportation systems by providing convenient and safe locations to transfer from single passenger vehicles to local or regional transit buses, carpools, or vanpools. An increase in usage of these facilities can lead to an increase in person throughput along congested streets and highways, which is a Department identified goal of High-Occupancy Vehicle systems. Local and regional agencies fund park and ride improvements, but have been complaining that Departmental policies and California laws restrict their ability to make needed investments. Research needs to be done to assess the validity of these statements and determine methods to allow for increased investment of park and ride lots.

IV. **Objective:**

The objective of the research is to determine ways to increase local and regional investment in park and ride lots. Research must be completed to analyze existing California laws, Departmental policies and procedures, and other barriers that hinder local and regional agencies from investing in park and ride lots. Activities on park and ride lots that need to be considered include managing and improving park and ride lots; installing features on park and ride lots to increase usage; relinquishing lots to local and regional agencies; and planning and constructing new park and ride lots on existing State right-of-way. The analysis should provide the Department with information to plan park and ride improvements and to suggest changes that can be made to laws, policies, and procedures to increase future investment.

V. **Task Description of Work and Expected Deliverables:**

A) Analysis of all laws, polices, and procedures that impact investment into park and ride lots including restrictions to implementing improvements on park and ride lots. The analysis will include a description of park and ride lots throughout California, including the Department's Park and Ride Program and other park and ride lots completely under the control of local and regional agencies (Interim Report).

B) Assessment of the impacts the identified restrictions have on the usage of park and ride lots and the overall performance of the entire transportation system. Consider each restriction individually (Interim Report).

C) A listing of all potential changes in laws, policies, procedures, and other areas that would potentially increase investment in park and ride lots. This includes investment by not only by local and regional agencies, but also by the Department (Interim Report).

D) Recommendations on future changes the Department can instigate or advocate that will make it easier to invest into park and ride lots (Interim Report).
E) A final report that incorporates all interim reports.
F) All analysis must consider park and ride lot usage; impacts to transit, carpools, and vanpools; and the impact on the entire transportation system including mainline performance.

VI. **Background:**

Activities to quantify positive park-and-ride lot impacts on the transportation include:

A) Analysis of literature search related to park-and-ride lots, including assessing transportation models, TDM strategies, case studies, transit linkage, HOV impacts, and other areas.
B) Quantification of existing and potential positive impacts of park-and-ride lot use concentrating on reduced congestion, pollution, and demand on our highways in addition to increased transit use.
C) Recommendations of ways to better utilize current and potential future lot locations.

These activities should result in valid information for planners and decision-makers to use when recommending multimodal transportation alternatives.

VII. **Estimate of Duration:** One (1) Year

VIII. **Related Research:** Preliminary Investigations dated June 2, 2010.

IX. **Deployment Potential:** TBD

X. **Authors:** Project Panel Member: Scott Sauer; Task Project Manager: Bob Justice

Date: June 27, 2011

DIVISION OF RESEARCH AND INNOVATION

Research Initial Scope of Work

SUBMITTAL FORM - FY 11/12

I. **Project Number:** P542
Project Title: Air Quality: The Effectiveness of High Occupancy Vehicle (HOV) Lanes

II. **Task Number:** 2329
Task Title: Deployment of Prior HOV Lanes Research Results in Developing Analysis Tools for New Managed Lanes Projects

III. **Project Problem Statement:**

A critical component of improving California's air quality is the evaluation of air quality benefits of various transportation projects (including managed lanes) in California.

IV. **Objective:**

The objective of this project is to develop tools for analyzing the emissions of new transportation projects (in the operational phase), excluding construction, existing HOV lanes, and regional planning.

V. **Task Description of Work and Expected Deliverables:**

1) Develop analysis tools to compare emissions of various types of managed lanes, of which HOV lanes are a subset.
2) Compare emission impacts of new projects involving: HOV lanes, HOT lanes, and Mixed Flow (MF) lanes, converted lanes (from existing MF, HOV, or HOT lanes, and no-build (on a comparable basis as built)
3) Analysis tools should be compatible with the EMission FACtors (EMFAC Model), which is the only microscopic model approved for regulatory use in California.

Note: Further microscopic modeling development is discouraged, as the preference is for development of a more general analysis tool suitable for use by Caltrans traffic modelers and project analytical staffs.

Deliverables Summary:
EMFAC Model oriented analysis tools that are easy to use by technical staffs, who are not highly specialized modelers, to calculate the emissions of proposed new HOV, HOT lane(s), part-time HOV lane(s) as used in Northern California, new MF lane(s), or converted lane(s), and compare those to emissions of the no-build alternative.

VI. **Background:**

There is a need for more research and evaluation of air quality benefits of new managed lanes in California, specifically in the area of developing general analysis tools.

VII. **Estimate of Duration:** Three (3) years

VIII. **Related Research:** Task ID 0587—Modeling the Effectiveness of HOV Lanes at Improving Air Quality

IX. **Deployment Potential:** TBD

X. **Authors:** Project Panel Members: David Ipps, Mike Brady, Rodney Tavitas
Task Project Manager: Bob Justice

Date: June 20, 2011

DIVISION OF RESEARCH AND INNOVATION

Research Initial Scope of Work

SUBMITTAL FORM - FY 11/12

I. **Project Number:** P92
Project Title: Development for the GPS-Automated Travel Diary (GPS-ATD) in Preparation for the 2010 Statewide Travel Behavior Survey

II. **Task Number:** 2334
Task Title: Development of Method for Continuous Statewide Travel Behavior Surveys to Estimate Various Emissions through Travel Models

III. **Project Problem Statement:**

The California Department of Transportation (Department) is currently conducting the California Household Travel Survey (CHTS) that is normally done every ten years. The purpose of the CHTS is to update the statewide database of household travel behavior which will be used to estimate, model and forecast travel throughout the State. The 2010 CHTS will be conducted to provide regional trip activities and inter-regional long-distance trips that will be used for the statewide model and regional travel models.

The cost for the CHTS keeps on rising and as such the Department is looking into alternatives to lower the cost. One such alternative was to use a handheld GPS device that not only tracked the traveler's trips but also had a basic survey that could replace a pen and paper travel diary.

With the increase in smartphone useage, the further development of a handheld GPS Advanced Travel Diary (GPS/ATD) was no longer necessary. The focus then changed to create a software application that could utilize the smartphone's internal memory and GPS ability to replace the GPS/ATD.

IV. **Objective:**

This research is a continuation to the previous research done on the smartphone platform. The existing Android application needs to be converted to cover the more popular operating systems to allow the Advanced Travel Diary to reach more users. After the application is on multiple platforms, a survey will need to be conducted to gather travel data. A statistical analysis will then be performed to evaluate the application and data.

V. **Task Description of Work and Expected Deliverables:**

A) Current Android Application running on other smartphone operating systems:
   1. Apple iOS4 and newer;
   2. Windows Mobile 5 through 6.5;
   3. Windows Phone 7 and newer;
   4. Blackberry OS versions 4.5 and newer;
B) Conduct a survey to gather travel data.
C) Statistical analysis of the application and data.
D) Evaluate implementation of the Advanced Travel Diary to determine if it is a possible replacement or enhancement for the California Household Travel Survey.

E) Identify the weighting scheme used on the data to compensate for the use of only those people with smartphones.
F) Identify the costs and barriers for deploying this application.
G) Further development of the questionnaire portion of the application with input from a committee to be determined by the Department.

VI. **Background:**

The Department has been conducting the California Household Travel Survey (CHTS) every ten years since 1950 for planning and policy applications. The last CHTS, conducted in Fiscal Years 2000/01, was the first comprehensive statewide activity-based household travel survey conducted in California. The last CHTS collected information from 17,000 households and was a collaborative effort with MPOs and RTPAs.

The CHTS is a rich database of household activity travel information across the State. The CHTS compliments other national survey efforts including the National Household Travel Survey, the American Communities Survey (ACS), the U.S. Census, and the Census Transportation Planning Product (CTPP).

Travel diaries have progressed over the last few decades due to improved understanding of trip generation. Survey methods evolved from the mail based paper and pencil interviews in the 1960's, through the computer-assisted telephone interviews in 1980's, to the electronic travel diaries (with or without GPS) of today. Each method has improved upon the previous approaches by better capturing incidental trips, reducing underreporting, improving data accuracy, and minimizing respondent burden and fatigue.

VII. **Estimate of Duration:** Two (2) Years

VIII. **Related Research:**
A) Deployment Support and Data Collection for Caltrans TSI Travel Behavior Survey using the GPS-ATD (Caltrans)
B) Development of Vehicular and Personal Longitudinal Travel Diary Systems Using GPS and New Technology (Caltrans)
C) Application of High-Sensitivity GPS for a Highly-Integrated Automated Longitudinal Travel Behavior Diary (Institute of Navigation GNSS Conference, Fort Worth, Texas, September 25-28, 2007)
D) California Household Travel Survey (Caltrans)

IX. **Deployment Potential:** Economical and more frequent household travel surveys.

X. **Author:** Bradley Mizuno

Date: June 30, 2011

DIVISION OF RESEARCH AND INNOVATION

Research Initial Scope of Work

SUBMITTAL FORM - FY 11/12

I. **Project Number:** P136
Project Title: Air Quality: Mitigation Measures

II. **Task Number:** 2331
Task Title: Developing Air Quality Mitigation Measures for Projects' Operational Emissions

III. **Project Problem Statement:**

When Caltrans delivers any transportation project, the potential air quality (AQ) impacts from the operation of the project must be disclosed in its environmental document. If the air pollutants emissions would be deemed significant or would contribute to a violation of one or more Federal or State air quality standards, those air quality impacts will need to be mitigated. After some investigation efforts by Caltrans, there is still a shortage of effective mitigation measures for most air pollutants.

IV. **Objective**:

Air quality mitigation measures have been widely used in the construction phase of transportation projects, mainly to reduce fugitive dust emissions. But mitigation measures for the operational phase of a project are much less established. The purpose of this study is to focus on developing mitigation measures for the emissions in the operational phase of a project, i.e., after the project is open to traffic.

A recent, related research study by UC-Davis investigated mitigation measures, mainly for Particulate Matter (PM) emissions from diesel exhaust. There is still a need to investigate mitigation measures for other (non-exhaust) PM emissions, and also for a number of emerging air pollutants of interest. Those emerging pollutants, originally included Mobile Source Air Toxics (MSAT), are now extended to include several, traditional criteria pollutants because of new or pending ambient air quality standards.

Note: This study will NOT include Greenhouse Gases (GHG).

V. **Task Description of Work and Expected Deliverables:**

This research task is to develop a list of mitigation measures for reducing the air quality impacts of operating a transportation project. The final product should include a comparison of the measures in terms of: degree of innovation, feasibility for use with transportation projects, and demonstrated effectiveness in reducing emissions and/or minimizing receptor exposures.

The deliverable product must contain a separate list of mitigation measures for each of the following six (6) categories of air pollutants:

1. Non-Exhaust Particulate Matter (PM) – Re-entrained Road Dust; and Tire & Brake Wear;
2. Mobile Source Air Toxics (MSAT) – Other than diesel PM;
3. Nitrogen Dioxide (NO2);
4. Sulfur Dioxide (SO2);
5. Carbon Monoxide (CO); and
6. Lead (Pb).

VI. **Background:**

As mentioned above, a prior study by UC-Davis had investigated AQ mitigation measures, but mainly developed information for diesel particulate matter (DPM). The current study would continue where that prior study left off.

VII. **Estimate of Duration:** Two (2) years.

VIII. **Related Research:**

A Preliminary Investigation (P. I.), recently completed in April 2011, had conducted a survey of State Departments of Transportation (DOTs). Its findings were that there is a paucity of research in AQ mitigation measures for operational emissions.

IX. **Deployment Potential**:

The final products of this research task will be immediately deployed in the preparation of environmental documents of Caltrans transportation projects, as appropriate, in order to ensure and expedite their delivery.

X. **Author:** Air Quality Technical Advisory Panel (TAP), Coordinator: David Ipps
Planning, Policy, System Information (PPSI)

Date: July 7, 2011